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## **Small Entity Compliance Guide**

### **Operation of Wireless Communication Services in the 2.3 GHz Band**

Order on Reconsideration  
WT Docket No. 07-293, IB Docket No. 95-91  
Released: October 17, 2012

**This Guide is prepared in accordance with the requirements of Section 212 of the Small Business Regulatory Enforcement Fairness Act of 1996. It is intended to help small entities – small businesses, small organizations (non-profits), and small governmental jurisdictions – comply with the revised rules adopted in the above-referenced FCC rulemaking docket(s). This Guide is not intended to replace the rules and, therefore, final authority rests solely with the rules. Although we have attempted to cover all parts of the rules that might be especially important to small entities, the coverage may not be exhaustive. This Guide may, perhaps, not apply in a particular situation based upon the circumstances, and the FCC retains the discretion to adopt approaches on a case-by-case basis that may differ from this Guide, where appropriate. Any decisions regarding a particular small entity will be based on the statute and regulations.**

**In any civil or administrative action against a small entity for a violation of rules, the content of the Small Entity Compliance Guide may be considered as evidence of the reasonableness or appropriateness of proposed fines, penalties, or damages. Interested parties are free to file comments regarding this Guide and the appropriateness of its application to a particular situation; the FCC will consider whether the recommendations or interpretations in the Guide are appropriate in that situation. The FCC may decide to revise this Guide without public notice to reflect changes in the FCC's approach to implementing a rule, or to clarify or update the text of the Guide. Direct your comments and recommendations, or calls for further assistance, to the FCC's Consumer Center:**

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# **Operation of Wireless Communications Service in the 2.3 GHz Band**

## **Compliance Requirements**

### **1. Objectives of the Proceeding**

In the *Report and Order and Second Report and Order* adopted in May 2010 in WT Docket No. 07-293 and IB Docket No. 95-91, the Commission amended the Part 27 rules governing Wireless Communication Service (WCS) mobile and portable devices operating in the 2305-2320 MHz and 2345-2360 MHz bands to facilitate the provision of mobile broadband services. Together with the *Second Report and Order* in IB Docket No. 95-91, the *Report and Order* in WT Docket No. 07-293 established a regulatory framework for the co-existence of WCS and Satellite Digital Audio Radio Service (SDARS) licensees in the 2305-2360 MHz (2.3 GHz) band.<sup>1</sup> In the *Order on Reconsideration* in WT Docket No. 07-293 and IB Docket No. 95-91, the Commission affirmed, modified, and clarified its actions in the *Report and Order and Second Report and Order* in WT Docket No. 07-293 and IB Docket No. 95-91.

The previous Part 27 rules precluded WCS licensees from providing mobile services in the 2305-2320 MHz and 2345-2360 MHz bands. In the *Order on Reconsideration* in WT Docket No. 07-293, the Commission revised and/or clarified certain of its rules regarding the maximum allowed transmitter power and out-of-band emissions (OOBE) limits applicable to WCS mobile and portable devices and base stations in order to allow for the provision of mobile broadband services in much of the United States, while protecting adjacent-band SDARS, Aeronautical Mobile Telemetry (AMT), and Deep Space Network (DSN) operations from harmful interference.

As part of WCS licensees' duty to protect adjacent-band operations from new or modified WCS station proposals, the Commission established a notification process with SDARS licensees and coordination process with AMT and DSN users. Specifically, all WCS licensees must provide written notification (*e.g.*, certified letter, fax, or e-mail) to SDARS licensees of proposals for new or modified WCS base and fixed stations (except fixed customer premises equipment (CPE)), unless all parties reach an agreement for the WCS licensees to provide notification by some other means.

Contact information for SDARS licensees in the 2320-2345 MHz band can be obtained from the Commission's International Bureau database at <<http://licensing.fcc.gov/cgi-bin/ws.exe/prod/ib/forms/reports/swr030b.hts?set=>>> by performing an advanced search on the frequency band 2320-2345 MHz (lower frequency = 2320 MHz; upper frequency = 2345 MHz). This site can be accessed from the Commission's web page at [www.fcc.gov](http://www.fcc.gov) by selecting E-Filing from the menu at the top of the web page, and then scrolling down to and selecting International Bureau Electronic Filing System (MyIBFS). Alternatively, to access the International Bureau's database on the Commission's newly designed web page, select Data under the Tools & Data menu at the top of the web page, select Search FCC Databases, then scroll to and select International Bureau Application Filing & Reporting System-Search. In addition, WCS licensees operating base or fixed stations in the 2345-2360 MHz band must, prior to operation of such base or fixed stations, achieve a mutually satisfactory coordination agreement with the Aerospace and Flight Test Radio Coordinating Council (AFTRCC) for any AMT receiver within 45 kilometers or radio line of sight, whichever distance is larger, of the intended WCS base or fixed station location. AFTRCC's contact information is P.O. Box 12822, Wichita, KS 67277-2822, (316) 946-8826. Also, WCS licensees operating base or fixed stations in the 2305-2320 MHz band must, prior to operation of

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<sup>1</sup> A description of SDARS can be found on page 6 of the *Report and Order and Second Report and Order* in this proceeding.

such base or fixed stations, achieve a mutually satisfactory coordination agreement with the National Aeronautics and Space Administration (NASA) for base or fixed stations located within 145 kilometers of the Goldstone, CA earth station located at 35-25-33 N 116-53-23 W. NASA's contact information is Public Communications Office, NASA Headquarters, Suite 5K39, Washington, DC 20546-0001, (202) 358-0001 (Office), (202) 358-4338 (Fax).

To promote the rapid deployment of new broadband services to the American public and ensure that the WCS spectrum is used intensively in the public interest, the Commission also adopted enhanced performance (*i.e.*, buildout) requirements for WCS licensees. These requirements were modified in the *Order on Reconsideration* in this proceeding. The specific WCS performance requirements can be found in Section 27.14 of the Commission's rules, which can be found on the Commission's Internet site at [www.fcc.gov](http://www.fcc.gov). The performance requirements can also be found in paragraphs 120 and 121 of the *Order on Reconsideration* in this proceeding.

## **2. Regulations and Policies that the Commission Modified**

- **Small Business Compliance Obligation to Limit Harmful Interference in SDARS and AMT Contexts - Mobile and Portable Stations' Power Limit and Bands of Operation.**
  - To limit the potential for harmful interference to adjacent-band SDARS operations, the Commission amended the Part 27 Rules to permit WCS mobile and portable stations to use up to 250 milliwatts (mW) average equivalent isotropically radiated power (EIRP) per 5 megahertz (MHz) (50 mW/MHz), except that for mobile and portable stations compliant with the 3<sup>rd</sup> Generation Partnership Project's (3GPP's) Long Term Evolution (LTE) standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band, the average EIRP must not exceed 250 mW within any 5 megahertz of authorized bandwidth but may exceed 50 mW within any 1 megahertz of authorized bandwidth in WCS Blocks A and B (2305-2315 MHz and 2350-2360 MHz) (*see* 47 C.F.R. § 27.50(a)(3)(i));
  - WCS mobile and portable devices are limited to a maximum EIRP of 250 mW for any bandwidth greater than or equal to 5 megahertz.
  - WCS mobile and portable devices are not permitted to transmit in any portion of the WCS C Block (2315-2320 MHz) and the WCS D Block (2345-2350 MHz) due to the immediate adjacency of those blocks to the SDARS band at 2320-2345 MHz (*see* 47 C.F.R. § 27.50(a)(3)(ii)).
  - Mobile and portable devices using frequency division duplex (FDD) technology are restricted to transmitting in the 2305-2315 MHz band (*see* 47 C.F.R. § 27.50(a)(3)(i)).
  - The 3GPP is a collaboration between six telecommunications standards development organizations (The Association of Radio Industries and Businesses, Japan (ARIB), The Alliance For Telecommunications Industry Solutions, USA (ATIS), China Communications Standards Association (CCSA), The European Telecommunications Standards Institute (ETSI), Telecommunications Technology Association, Korea (TTA), and The Telecommunication Technology Committee, Japan (TTC)) for the development of advanced mobile telecommunications standards

for a 3G mobile system based on evolved GSM core networks and the radio access technologies that they support (*i.e.*, Universal Terrestrial Radio Access (UTRA), Frequency Division Duplex (FDD), and Time Division Duplex (TDD)), as well as evolved radio access technologies such as General Packet Radio Service (GPRS) and Enhanced Data rates for Global System for Mobile Communications (GSM) Evolution (EDGE).

▪ **Small Business Compliance Obligation to Respect Duty Cycle Limits and To Meet Requirements Involving Automatic Power Control - Duty Cycle Limits.**

- To further limit the potential for harmful interference to SDARS operations, the Commission also established duty cycle limitations and automatic transmit power control (ATPC) requirements for WCS mobile and portable devices and fixed customer premises equipment (CPE) stations.
  - For mobile and portable stations using time division duplex (TDD) technology, the duty cycle must not exceed 38 percent in the 2305-2315 MHz and 2350-2360 MHz bands (*see* 47 C.F.R. § 27.50(a)(3)(i)).
  - Power averaging must not include intervals during which the transmitter is off (*see* 47 C.F.R. § 27.50(a)(3)(i)).
  - Mobile and portable stations transmitting in the 2305-2315 MHz band or in the 2350-2360 MHz band must employ ATPC when operating so the stations operate with the minimum power necessary for successful communications (*see* 47 C.F.R. § 27.50(a)(3)(iii)).
  - The use of external vehicle-mounted antennas for mobile and portable stations transmitting in the 2305-2315 MHz band or the 2350-2360 MHz band is prohibited (47 C.F.R. § 27.50(a)(3)(iv)).

- **Small Business Compliance Obligation Involving Facilitation of WC Mobile Service - Base and Fixed Stations' Power Limits.** To facilitate the provision of WCS mobile service, base and fixed stations operating in WCS Blocks A and B are permitted to operate with up to a 2 kilowatts (kW) average EIRP per 5 megahertz (2 kW/5 MHz) with a peak to average power ratio (PAPR) not to exceed 13 decibels referenced to 1 Watt (dB). The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that the PAPR will not exceed 13 dB for more than 0.1 percent of the time or using another Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission (*see* 47 C.F.R. § 27.50(a)(1)(A) and (B)). To limit the potential for interference to SDARS operations, however, base and fixed stations operating in WCS Blocks C and D (2315-2320 MHz and 2345-2350 MHz) are limited to a 2 kW peak EIRP level.

- **Customer premises equipment power limit and duty cycle.** For WCS fixed customer premises equipment (CPE) transmitting in the 2305-2320 MHz band or in the 2345-2360 MHz band, the peak EIRP must not exceed 20 Watts (W) within any 5 megahertz of authorized bandwidth. Fixed WCS CPE must employ ATPC so the stations operate with the minimum power necessary for successful communications. The use of outdoor antennas for

fixed WCS CPE stations or outdoor fixed WCS CPE station installations operating with 2 W per 5 megahertz (2 W/5 MHz) or less average EIRP using the stepped emissions mask prescribed in § 27.53(a)(3) of the Commission's rules is prohibited, unless such antennas are professionally installed in locations removed by 20 meters from roadways, or in locations where it can be shown that the ground power level of -44 decibels referenced to 1 mW (dBm) in the WCS A or B blocks or -55 dBm in the WCS C or D blocks will not be exceeded at the nearest road location. The use of outdoor antennas for fixed WCS CPE stations operating with 2 watts per 5 megahertz (2 W/5 MHz) or less average EIRP and the emissions mask prescribed in §§ 27.53(a)(1)(i)-(iii) of the Commission's rules is permitted in all locations. For fixed WCS CPE using TDD technology, the duty cycle must not exceed 38 percent (*see* 47 C.F.R. § 27.50(a)(2)).

- **Small Business Compliance Obligation Involving Out-of-Band Emissions Limits.** The Commission also relaxed the out-of-band (OOBE) limits for WCS mobile and portable stations, WCS base and fixed stations, and fixed WCS CPE. For operations in the 2305-2320 MHz band and the 2345-2360 MHz band, the power of any emissions outside a licensee's frequency band(s) of operation must be attenuated below the transmitter power P (with averaging performed only during periods of transmission) within the licensed band(s) of operation, in Watts, by the following amounts:
  - **Mobile and portable devices and fixed CPE stations.** For WCS mobile and portable devices transmitting in the 2305-2315 MHz and 2350-2360 MHz bands, and for fixed WCS CPE stations operating in the 2305-2320 MHz and 2345-2360 MHz bands with 2 Watts or less average EIRP, the OOBE, as measured over a 1-megahertz resolution bandwidth, must be attenuated below the transmitter power P by a factor of not less than:
    - $43 + 10 \log (P)$  dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation,
    - $55 + 10 \log (P)$  dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz,
    - $61 + 10 \log (P)$  dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz,
    - $67 + 10 \log (P)$  dB on all frequencies between 2328 and 2337 MHz,
    - $43 + 10 \log (P)$  dB on all frequencies between 2300 and 2305 MHz,
    - $55 + 10 \log (P)$  dB on all frequencies between 2296 and 2300 MHz,
    - $61 + 10 \log (P)$  dB on all frequencies between 2292 and 2296 MHz,
    - $67 + 10 \log (P)$  dB on all frequencies between 2288 and 2292 MHz,
    - $70 + 10 \log (P)$  dB below 2288 MHz;
    - $43 + 10 \log (P)$  dB on all frequencies between 2360 and 2365 MHz, and

- $70 + 10 \log (P)$  dB on all frequencies above 2365 MHz (*see* 47 C.F.R. §§ 27.53(a)(3)(i)-(iii) and (4)(i)-(iii)).
- **Base, fixed, and fixed CPE stations.** For base and fixed stations' operations, and for fixed WCS CPE operating with an average EIRP greater than 2 Watts, in the 2305-2320 MHz band and the 2345-2360 MHz band, the OOB E, as measured over a 1-megahertz resolution bandwidth, must be attenuated below the transmitter power P by a factor of not less than:
  - $43 + 10 \log (P)$  dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band of operation;
  - $75 + 10 \log (P)$  dB on all frequencies between 2320 and 2345 MHz;
  - $43 + 10 \log (P)$  dB on all frequencies between 2300 and 2305 MHz,
  - $70 + 10 \log (P)$  dB on all frequencies between 2287.5 and 2300 MHz,
  - $72 + 10 \log (P)$  dB on all frequencies between 2285 and 2287.5 MHz,
  - $75 + 10 \log (P)$  dB below 2285 MHz;
  - $43 + 10 \log (P)$  dB on all frequencies between 2360 and 2362.5 MHz,
  - $55 + 10 \log (P)$  dB on all frequencies between 2362.5 and 2365 MHz,
  - $70 + 10 \log (P)$  dB on all frequencies between 2365 and 2367.5 MHz,
  - $72 + 10 \log (P)$  dB on all frequencies between 2367.5 and 2370 MHz, and
  - $75 + 10 \log (P)$  dB above 2370 MHz (*see* 47 C.F.R. §§ 27.53(a)(1)(i)-(iii), (2)(i)-(iii)).
- **Small Business Compliance Option: A Private Contractual Agreement** - The out-of-band emissions limits noted above may be modified by the private contractual agreement of all affected licensees, who must maintain a copy of the agreement in their station files and disclose it to prospective assignees, transferees, or spectrum lessees and, upon request, to the Commission (*see* 47 C.F.R. § 27.53(a)(10)).
- **Small Business Compliance Obligation Involving Measurement Instrumentation Procedures- Measurement Procedure.** Compliance with the WCS out-of-band emission limits is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1-megahertz bands immediately outside and adjacent to the channel blocks at 2305, 2310, 2315, 2320, 2345, 2350, 2355, and 2360 MHz, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (*i.e.*, 1 megahertz). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are



attenuated at least 26 dB below the transmitter power. With respect to television operations, measurements must be made of the separate visual and aural operating powers at sufficiently frequent intervals to ensure compliance with the rules (*see* 47 C.F.R. § 27.53(a)(5)).

- **Small Business Compliance Obligations Involving Protection of SDARS Operations from Harmful Interference – Harmful Interference to SDARS Operations Requiring Resolution.** The following conditions will be presumed to constitute harmful interference to SDARS operations from WCS operations in the 2305-2320 MHz and 2345-2360 MHz bands and require WCS operators to work cooperatively with SDARS operators to address areas where such power levels are exceeded and harmful interference occurs:
  - (1) A WCS ground signal level greater than -44 dBm in the upper or lower A or B block, or -55 dBm in the C or D block, present at a location on a roadway, where a test demonstrates that SDARS service would be muted over a road distance of greater than 50 meters; or
  - (2) A WCS ground signal level exceeding -44 dBm in the upper or lower A or B block, or -55 dBm in the C or D block on a test drive route, which is mutually agreed upon by the WCS licensee and the SDARS licensee, for more than 1 percent of the cumulative surface road distance on that drive route, where a test demonstrates that SDARS service would be muted over a cumulative road distance of greater than 0.5 percent (incremental to any muting present prior to use of WCS frequencies in the area of that drive test).
- **Small Business Compliance Obligations Involving Various Kinds of Information Sharing – Information – Sharing Requirements.** WCS licensees in the 2305-2320 MHz and 2345-2360 MHz bands are required to share information regarding the location and operation of proposed base and fixed stations (except fixed WCS CPE) with SDARS licensees in the 2320-2345 MHz band (*see* 47 C.F.R. § 27.72).
  - **Sites and frequency selections.** WCS licensees must select base and fixed station sites and frequencies, to the extent practicable, to minimize the possibility of harmful interference to operations in the 2320-2345 MHz SDARS band (*see* 47 C.F.R. § 27.72(a)).
  - **Prior notice periods.** WCS licensees that intend to operate a base or fixed station must, before commencing such operation, provide 10 business days prior notice to all SDARS licensees. WCS licensees that intend to modify an existing base or fixed station must, before commencing such modified operation, provide 5 business days prior notice to all SDARS licensees. For the purposes of this section, a business day is defined as all days, including days when the Commission opens later than 8:00 a.m., which are not “holidays” (*i.e.*, Saturday, Sunday, officially recognized Federal legal holidays and any other day on which the Commission’s offices are closed and not reopened prior to 5:30 p.m.) (*see* 47 C.F.R. §§ 0.403, 1.4(e)(1) and (2), 27.72(b)).
    - For modifications other than changes in location, a licensee may provide notice within 24 hours after the modified operation if the modification does not result in a predicted increase of the power flux density (PFD) at ground level by more than 1 dB since the last advance notice was given. If a demonstration is made by the SDARS licensee that such

modifications may cause harmful interference to SDARS receivers, WCS licensees will be required to provide notice 5 business days in advance of additional station modifications.

- WCS base and fixed stations operating below 2 watts equivalent isotropically radiated power (EIRP) are exempt from the notice requirements set forth in this paragraph.
  - WCS and SDARS licensees may enter into agreements regarding alternative notification procedures.
- **AM Broadcast Station Notification.** Per Section 27.63 of the Rules, WCS licensees that plan to construct or modify towers within 1 kilometer (0.6 mile) of non-directional AM broadcast station tower and within 3 kilometers (1.9 miles) of a directional AM broadcast station array must also notify the licensee of the AM broadcast station in advance of the planned construction or modification.
- **Provide SDARS licensees an inventory.** WCS licensees are required to provide SDARS licensees an inventory of their deployed infrastructure consistent with, and within 30 days of the effective date of Section 27.72 of the Commission's Rules. Sections 27.72(b) and 27.72(c) of the Rules, which contain new or modified information collection requirements that require approval by the Office of Management and Budget under the Paperwork Reduction Act, will become effective after the Commission publishes a notice in the Federal Register announcing such approval and the relevant effective date.
- **Contents of notice.** Notification must be written (*e.g.*, certified letter, facsimile (fax), or e-mail) and include the licensee's name, and the name, address, and telephone number of its coordination representative, unless the SDARS licensee and all potentially affected WCS licensees reach a mutual agreement to provide notification by some other means. WCS licensees and SDARS licensees may establish such a mutually agreeable alternative notification mechanism without prior Commission approval, provided that they comply with all other requirements of this section. Regardless of the notification method, the WCS licensee must specify relevant technical details, including, at a minimum: (i) The coordinates of the proposed base or fixed station to an accuracy of no less than  $\pm 1$  second latitude and longitude; (ii) The proposed operating power(s), frequency band(s), and emission(s); (iii) The antenna center height above ground and ground elevation above mean sea level, both to an accuracy of no less than  $\pm 1$  meter; (iv) The antenna gain pattern(s) in the azimuth and elevation planes that include the peak of the main beam; and (v) The antenna downtilt angle(s). A WCS licensee operating base or fixed stations must maintain an accurate and up-to-date inventory of its base stations, including the information set forth in Section 27.72(c)(2) of the Commission's Rules, which shall be available upon request by the Commission (*see* 47 C.F.R. § 27.72(c)).
- **Calculation of notice period.** Notice periods are calculated from the date of receipt by the licensee being notified. If notification is by mail, the date of receipt is evidenced by the return receipt on certified mail. If notification is by fax, the date of receipt is evidenced by the notifying party's fax transmission confirmation log. If notification is by e-mail, the date of receipt is evidenced by a return e-mail receipt. If the SDARS



licensee and all potentially affected WCS licensees reach a mutual agreement to provide notification by some other means, that agreement must specify the method for determining the beginning of the notice period (*see* 47 C.F.R. § 27.72(d)).

- **Small Business Compliance Obligation Involving Duty to Cooperate and Possibility of Restrictions and Other Sanctions to Be Imposed for Non-Compliance - Duty to Cooperate.** WCS licensees must cooperate in good faith in the selection and use of new station sites and new frequencies to reduce interference and make the most effective use of the authorized facilities. WCS licensees should provide SDARS licensees as much lead time as practicable to provide ample time to conduct analyses and opportunity for prudent base station site selection prior to WCS licensees entering into real estate and tower leasing or purchasing agreements. WCS licensees must have sufficient operational flexibility in their network design to implement one or more technical solutions to remedy harmful interference. Licensees of stations suffering or causing harmful interference must cooperate in good faith and resolve such problems by mutually satisfactory arrangements. If the licensees are unable to do so, the Commission's Wireless Telecommunications Bureau, in consultation with the Commission's Office of Engineering and Technology and the International Bureau, will consider the actions taken by the parties to mitigate the risk of and remedy any alleged interference. In determining the appropriate action, the Bureau will take into account the nature and extent of the interference and act promptly to remedy the interference. The Bureau may impose restrictions on WCS licensees, including specifying the transmitter power, antenna height, or other technical or operational measures to remedy the interference, and will take into account previous measures by the licensees to mitigate the risk of interference (*see* 47 C.F.R. § 27.72(e)).
- **Small Business Compliance Obligation Involving Coordination Requirements - WCS, AMT, and Goldstone Coordination Requirements.** WCS licensees in the 2345-2360 MHz band are also required to coordinate the deployment of base and fixed stations (except fixed WCS CPE) with Aeronautical Mobile Telemetry (AMT) facilities in the 2360-2395 MHz band; and to take all practicable steps necessary to minimize the risk of harmful interference to AMT facilities (*see* 47 C.F.R. § 27.73).
  - **AMT coordination.** To protect AMT operations in the 2360-2395 MHz band from harmful interference, WCS licensees operating base or fixed stations (except fixed WCS CPE) in the 2345-2360 MHz band shall, prior to operation of such base and fixed stations, achieve a mutually satisfactory coordination agreement with the Aerospace and Flight Test Radio Coordinating Council (AFTRCC) for any AMT receiver facility within 45 kilometers or the radio line of sight, whichever distance is larger, of the intended WCS base or fixed station location. This coordination is necessary to protect AMT receive systems consistent with International Telecommunications Union (ITU-R) Recommendation ITU-R M.1459. The locations of the current and planned Federal and non-Federal AMT receiver sites may be obtained from AFTRCC (*see* 47 C.F.R. § 27.73(a)).
  - **Goldstone coordination.** To protect Deep Space Network (DSN) operations in the 2290-2300 MHz band from harmful interference, WCS licensees operating base and fixed stations (except fixed WCS CPE) in the 2305-2320 MHz band shall, prior to operation of such base and fixed stations, achieve a mutually satisfactory coordination

agreement with the National Aeronautics and Space Administration (NASA) within 145 kilometers of the Goldstone, CA earth station site (35°25'33" N, 116°53'23" W) (*see* 47 C.F.R. § 27.73(b)).

- After base or fixed station operations commence, upon receipt of a complaint of harmful interference, the WCS licensee(s) receiving the complaint, no matter the distance from the NASA Goldstone, CA earth station or from an AMT site, operating in the 2305-2320 or 2345-2360 MHz bands, respectively, shall take all practicable steps to immediately eliminate the interference (*see* 47 C.F.R. § 27.73(c)).
- **Small Business Compliance Obligation Involving Duty to Cooperate and Possibility of Restrictions and Other Sanctions To Be Imposed for Non-Compliance - Duty to Cooperate.** WCS licensees, AFTRCC, and NASA must cooperate in good faith in the coordination and deployment of new facilities. WCS licensees must also cooperate in good faith in the selection and use of new station sites and new frequencies when within radio line of site of AMT receiver facilities to reduce the risk of harmful interference and make the most effective use of the authorized facilities. Licensees of stations suffering or causing harmful interference must cooperate in good faith and resolve such problems by mutually satisfactory arrangements. If the licensees are unable to do so, the Commission's Wireless Telecommunications Bureau, in consultation with the Commission's Office of Engineering and Technology and the National Telecommunications and Information Administration may impose restrictions including specifying the transmitter power, antenna height, or area or hours of operation of the stations (*see* 47 C.F.R. § 27.73(d)).

**Small Business Compliance Obligation Involving Performance Requirements, *e.g.*, Construction Requirements and Criteria for Renewal - Performance Requirements (construction requirements, criteria for renewal).**

WCS licensees holding authorizations for Block A in the 2305-2310 MHz and 2350-2355 MHz bands, Block B in the 2310-2315 MHz and 2355-2360 MHz bands, Block C in the 2315-2320 MHz band, and Block D in the 2345-2350 MHz band, must, as a performance requirement, make a showing of "substantial service" in their license area within the prescribed license term set forth in Section 27.13 of the Commission's Rules. "Substantial service" is defined as service which is sound, favorable and substantially above a level of mediocre service which just might minimally warrant renewal. Failure by any licensee to meet this requirement will result in forfeiture of the license and the licensee will be ineligible to regain it (*see* 47 C.F.R. § 27.14).

- The following enhanced performance requirements apply to licensees holding authorizations for Block A in the 2305-2310 MHz and 2350-2355 MHz bands, Block B in the 2310-2315 MHz and 2355-2360 MHz bands, Block C in the 2315-2320 MHz band, and Block D in the 2345-2350 MHz band (*see* 47 C.F.R. § 27.14(p)).
- For mobile and point-to-multipoint systems in Blocks A and B, and point-to-multipoint systems in Blocks C and D, a licensee must provide reliable signal coverage and offer service to at least 40 percent of the license area's population by March 13, 2017, and to at least 75 percent of the license area's population by September 13, 2019. If, when filing the construction notification required under § 1.946(d) of the Commission's Rules, a WCS licensee demonstrates that 25 percent or more of the license area's population for Block A, B, or D is within a coordination zone as defined by Section 27.73(a) of the

Commission's Rules, the foregoing population benchmarks are reduced to 25 and 50 percent, respectively. The percentage of a license area's population within a coordination zone equals the sum of the Census Block Centroid Populations within the area, divided by the license area's total population (*see* 47 C.F.R. § 27.14(p)(1)).

- For point-to-point fixed systems, except those deployed in the Gulf of Mexico license area, a licensee must construct and operate a minimum of 15 point-to-point links per million persons (one link per 67,000 persons) in a license area by March 13, 2017, and 30 point-to-point links per million persons (one link per 33,500 persons) in a licensed area by September 13, 2019. The exact link requirement is calculated by dividing a license area's total population by 67,000 and 33,500 for the respective milestones, and then rounding upwards to the next whole number. For a link to be counted towards these benchmarks, both of its endpoints must be located in the license area. If only one endpoint of a link is located in a license area, it can be counted as a one-half link towards the benchmarks (*see* 47 C.F.R. § 27.14(p)(2)).
- For point-to-point fixed systems deployed on any spectrum block in the Gulf of Mexico license area, a licensee must construct and operate a minimum of 15 point-to-point links by March 13, 2017, and a minimum of 15 point-to-point links by September 13, 2019 (*see* 47 C.F.R. § 27.14(p)(3)).
- Under these performance requirements, each fixed link must provide a minimum bit rate, in bits per second, equal to or greater than the bandwidth specified by the emission designator in Hertz (*e.g.*, equipment transmitting at a 5 megabit per second (Mb/s) rate must not require a bandwidth of greater than 5 megahertz) (*see* 47 C.F.R. § 27.14(p)(4)).
- If an initial authorization for a license area is granted after March 13, 2013, then the applicable benchmarks noted above must be met within 48 and 78 months, respectively, of the initial authorization grant date (*see* 47 C.F.R. § 27.14(p)(5)).
- Licensees must use the most recently available U.S. Census Data at the time of measurement to meet these performance requirements (*see* 47 C.F.R. § 27.14(p)(6)).
- **Small Business Compliance Obligation Involving Certification of Compliance -** Licensees must certify compliance with the applicable performance requirements by filing a construction notification with the Commission, within 15 days of the expiration of the relevant performance milestone, pursuant to Section 1.946(d) of the Commission's Rules. Each construction notification must include electronic coverage maps, supporting technical documentation, and any other information as the Wireless Telecommunications Bureau may prescribe by public notice. Electronic coverage maps must accurately depict the boundaries of each license area (Regional Economic Area Grouping (REAG) or Major Economic Area (MEA)) in the licensee's service territory. Further, REAG maps must depict MEA boundaries and MEA maps must depict Economic Area boundaries. If a licensee does not provide reliable signal coverage to an entire license area, its map must accurately depict the boundaries of the area or areas within each license area not being served. Each licensee also must file supporting documentation certifying the type of service it is providing for each REAG or MEA within its service territory and the type of technology used to provide such service. Supporting documentation must include the assumptions used to create the coverage maps,

including the propagation model and the signal strength necessary to provide reliable service with the licensee's technology (*see* 47 C.F.R. § 27.14(p)(7)).

- **Small Business Compliance Obligation: Risk of Automatic Termination of Authorization for Failure to Meet Any Applicable Performance Requirement** - If a licensee fails to meet any applicable performance requirement, its authorization will terminate automatically without further Commission action as of the applicable performance milestone and the licensee will be ineligible to regain it (*see* 47 C.F.R. § 27.14(p)(8)).

A copy of the *Order on Reconsideration* is available at

[http://fjallfoss.fcc.gov/edocs\\_public/attachmatch/FCC-12-130A1.pdf](http://fjallfoss.fcc.gov/edocs_public/attachmatch/FCC-12-130A1.pdf) 27 FCC Rcd 13651 (2012).

The Commission's Rules (47 Code of Federal Regulations (47 C.F.R.)) are available at

[http://wireless.fcc.gov/index.htm?job=rules\\_and\\_regulations](http://wireless.fcc.gov/index.htm?job=rules_and_regulations).